RADIOACTIVE EFFLUENT RELEASE DATA

JULY 1979 THROUGH DECEMBER 1979

TURKEY POINT PLANT

FLORIDA POWER & LIGHT COMPANY

FEBRUARY 22, 1980

ATTACHMENT I

SEMIANNUAL REPORT OF RADIOACTIVE EFFLUENT RELEASES, PTP UNITS 3 & 4, 7/79 - 12/79

Introduction

All liquid and airborne discharges to the environment during this reporting period were analyzed in accordance with Technical Specification requirements. The minimum frequency of analysis as required by Safety Guide 21 was met or exceeded.

Liquid Releases

Aliquots of representative pre-release samples were either isotopically analyzed for gamma emitting isotopes on a multichannel analyzer, or evaporated and analyzed for gross beta-gamma activity in a 2π gas flow proportional counter. The efficiency of the gas flow proportional counter is adjusted so that the activity determined by gross beta-gamma analysis approximates the isotopic activities determined by gamma spectrum analysis and selected beta determinations, exclusive of tritium and dissolved gases.

The above procedure was followed for all releases from the waste disposal system and for secondary system batch releases. Frequent periodic sampling and analysis were used to conservatively estimate the quantity of radioactivity released via the steam generator blowdown system.

The following comments will aid in the interpretation and evaluation of the liquid release data presented in Table I, pages 1 through 6:

1. The reported values in Table I, page 1, include in their computation the quantity of radioactivity released from both the waste disposal system and the secondary system. The secondary system releases occurred when contaminated water was blown down from the steam generators during primary to secondary leakage conditions, or when the generators were drained for repair or refueling, or during lancing of the generators. Beginning in November, activity which had entered the plant storm drain system was also included in the secondary system activity released and in the total activity released.

2. The reported values in Table I, pages 2 and 3 are the total quantities of radioactivity for individual nuclides released from the waste disposal system and the secondary system together. The values in Table I, page 4 are for the waste disposal system only and page 5 is for the secondary system only.

3. During primary to secondary leakage, release of several short-lived nuclides from the secondary system occurs. These short-lived nuclides are not generally detected in batch releases from the waste disposal system due to the long hold-up time of processed water. Only those isotopes that were detected in the secondary system releases were reported. All non-detectable isotopes are listed as (--).

4. Weekly and monthly composite samples for the waste disposal system were prepared to give proportional weight to each liquid release made during the designated period of accumulation. The composites were analyzed for gamma emitting isotopes on a multichannel analyzer attached to a high resolution Ge(Li) detector, and for Sr-89 and Sr-90, using a chemical separation and subsequent beta determination with a 2π gas flow proportional counter. Tritium was determined by use of liquid scintillation techniques and gross alpha radioactivity was determined by use of a 2π gas flow proportional counter. All concentrations for radioactivity determined from analysis of a composite were multiplied by the total represented volume of the liquid waste released to determine the total quantity of each isotope and of gross alpha activity released during the compositing period.

5. At least one representative batch of liquid effluent from the waste disposal system was analyzed monthly for dissolved fission and activation gases by use of gamma spectrum analysis. The resulting isotope concentrations were multiplied by the total volume released for the month in order to estimate the total dissolved gases released. If more than one batch of effluent was analyzed, the concentrations were weighted in an appropriate manner. The results are totaled on a monthly basis in Table I, page 6, Dissolved gases, if any, from

secondary system releases were determined from the samples of the individual releases. Isotopic concentrations were multiplied by the volume released to determine the quantity of radiogas nuclides released.

6. Representative samples of secondary system batch releases were analyzed individually for gamma emitting isotopes. Analysis of a representative composite for tritium, gross alpha and selected beta emitters was made for releases which occurred due to primary to secondary leakage.

7. The applicable limit for release of radioactive material in liquid waste is five curies per quarter excluding tritium and dissolved gases.

8. The following notes have been added to help explain some of the results in Table I:

On August 28, 1979, the Unit #4 Spent Fuel Pit was overflowed with a resultant release of approximately 3000 gallons of water to the ground surrounding the tank. The activity released was:

Co-57	1.4	mCi
Co-58	182	mCi
Co-60	908	mCi
Total	1091	mCi

Because the dirt was collected and handled as a solid waste (drummed), this activity was not included in our liquid activity released for August 1979. This release is documented as Reportable Occurrence 251-79-14.

Airborne Releases

Airborne releases to the atmosphere occurred from: release of gas decay tanks, the instrument bleedline, containment purges, and the secondary system during conditions of primary to secondary leakage. The techniques employed in determining the radioactivity in airborne releases are:

a) Gamma spectrum analysis for fission and activation gases.

b) Removal of particulate material by filtration and subsequent gamma-spectrum analysis, Sr-89-90 determination, gross alpha analysis, and gross beta-gamma analysis.

c) Absorption of halogen radionuclides on a charcoal filter and subsequent gamma-spectrum analysis, and

d) Condensation of water vapor in a gas sample followed by analysis for tritium using liquid scintillation techniques.

All sporadic gas releases from the plant which were not accounted for by the above methods were conservatively estimated as curies of Xe-133 equivalent by use of the plant vent process monitor recorder chart and the current calibration curve for the monitor.

The maximum rated capacity for the hogging jets and the maximum measured flow-rate for the condenser air ejectors, and an estimate of the rate of exhaust from the atmospheric dumps were used to conservatively estimate the airborne releases from the secondary system whenever applicable.

The following comments will aid in the interpretation and evaluation of the airborne release data presented in Table II.

1. Calculation of total radioactivity of noble gases, I-131, and particulates is based upon detectable radionuclides only.

2. The applicable limit for release of total radioactive materials in gaseous waste is 0.012 Ci/sec when averaged over the calendar quarter. The percent of the applicable limit for total gaseous release was computed as follows:

$$\% \text{ of Limit} = \frac{\text{Total curies released in gaseous waste during quarter} \times 100\%}{(.012 \text{ Ci/sec})(\text{seconds in quarter})}$$

3. The applicable limit for the release of I-131 and particulate radionuclides with half-lives greater than eight days in airborne waste is:

$$\Sigma \frac{Q_i}{MPC_i} \leq 10{,}000 \frac{m^3}{sec}, \text{ where } Q_i = \text{release rate of } i^{th} \text{ nuclide, Ci/sec}$$

and MPC_i = maximum permissible concentration of the i^{th} nuclide, Ci/m^3

The release rate, Q_i, was determined by dividing the total activity released in Ci, for the i^{th} nuclide ($t_{\frac{1}{2}} > 8d$), during the calendar quarter by the seconds in the quarter.

MPC_i values were obtained from 10CFR20, Appendix B, Table II, Column 1. The MPC chosen was the most conservative value of either the soluble or insoluble MPC for each isotope.

The percent of applicable limit was determined as follows:

$$\% \text{ of Limit} = \frac{\Sigma \frac{Q_i}{MPC_i} \times 100\%}{10{,}000 \text{ m}^3/\text{sec}}$$

4. The maximum gaseous release rate for each month is listed in Table II, page 1, under Section A, Line 3. The applicable limit for maximum allowable release rate is 6.7 E+04 µCi/sec.

5. All values reported in Table II, pages 2 and 3, include the particulate, gaseous, and halogen activity released from the containments during purging, auxiliary building (leakage from pumps, valves, etc), the gas waste disposal system and the secondary system during conditions of primary to secondary system leakage. If a minimum detectable activity value was not calculated for an isotope, it will be listed as (--).

1979 Table I Report of Radioactive Effluents: Liquid

Liquid Releases	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
A. Gross Radioactivity (β-γ)						
1. Total Release (mCi)	5.60 E+01	5.37 E+01*	5.41 E+01	2.09 E+01	2.30 E+01	4.64 E+01
2. Avg Concentration During Releases (uCi/ml)	2.5 E-10	2.5 E-10	1.7 E-10	8.4 E-11	8.6 E-11	3.1 E-10
3. Avg Concentration for Month (uCi/ml)	2.5 E-10	2.5 E-10	1.7 E-10	8.4 E-11	8.6 E-11	1.9 E-10
4. Max Concentration Released (uCi/ml)	2.5 E-09	1.1 E-08	1.1 E-09	2.8 E-09	2.2 E-09	3.4 E-09
5. Percent of Technical Specification Limit for Total Activity Released (%)		3.3 E+00			1.8 E+00	
B. Tritium						
1. Total Release (Ci)	4.64 E+01	1.26 E+02	8.52 E+01	1.45 E+02	8.48 E+01	1.55 E+02
2. Avg Concentration During Releases (uCi/ml)	2.1 E-07	5.9 E-07	2.7 E-07	5.9 E-07	3.2 E-07	1.0 E-06
3. Avg Concentration for Month (uCi/ml)	2.1 E-07	5.9 E-07	2.7 E-07	5.9 E-07	3.2 E-07	6.4 E-07
C. Dissolved Noble Gas						
1. Total Release (mCi)	2.59 E+00	2.61 E+01	3.18 E-01	2.40 E+01	3.68 E-01	3.34 E+00
2. Avg Concentration During Releases (uCi/ml)	1.2 E-11	1.2 E-10	1.0 E-12	9.7 E-11	1.4 E-12	2.2 E-11
3. Avg Concentration for Month (uCi/ml)	1.2 E-11	1.2 E-10	1.0 E-12	9.7 E-11	1.4 E-12	1.4 E-11
D. Gross Alpha Radioactivity						
1. Total Release (mCi)	(<1.0 E-08)	(<6.2 E-09)	(<6.2 E-09)	(<9.4 E-09)	(<7.8 E-09)	(<9.0 E-09)
2. Avg Concentration During Releases (uCi/ml)	(<4.5 E-20)	(<2.9 E-20)	(<2.0 E-20)	(<3.8 E-20)	(<2.9 E-20)	(<6.0 E-20)
3. Avg Concentration for Month (uCi/ml)	(<4.5 E-20)	(<2.9 E-20)	(<2.0 E-20)	(<3.8 E-20)	(<2.9 E-20)	(<3.8 E-20)
E. Volumes						
1. Vol of Liquid Waste to Discharge (Liters)	2.13 E+07	1.65 E+07	1.63 E+07	1.85 E+07	1.29 E+07	1.19 E+07
2. Vol of Dilution Water During Rel (Liters)	2.20 E+11	2.14 E+11	3.14 E+11	2.48 E+11	2.66 E+11	1.50 E+11
3. Vol of Dilution Water for Month (Liters)	2.20 E+11	2.14 E+11	3.14 E+11	2.48 E+11	2.66 E+11	2.40 E+11

uCi/ml ... See note in liquid releases paragraph 8.

Isotope	Unit	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Ag-110m	mCi	1.84 E-02	8.36 E-02	3.77 E-02	6.95 E-01	3.2 E-02	6.12 E-01
Ba-140	mCi	(<8.9 E-08)	(<1.6 E-07)	(<8.8 E-08)	(<1.4 E-07)	(<1.0 E-07)	(<1.2 E-07)
Co-57	mCi	(<1.6 E-08)	(<2.4 E-08)	(<1.5 E-08)	1.36 E-02	(<1.7 E-08)	(<1.9 E-08)
Co-58	mCi	2.19 E+00	3.22 E+00	5.79 E-01	1.94 E+00	7.49 E-01	6.03 E+00
Co-60	mCi	4.32 E+00	7.42 E+00	4.21 E+00	6.41 E+00	3.92 E+00	1.18 E+01
Cr-51	mCi	(<2.0 E-07)	(<3.3 E-07)	(<1.9 E-07)	(<3.0 E-07)	(<2.3 E-07)	3.43 E+00
Cs-134	mCi	6.97 E-01	6.36 E+00	2.18 E+00	3.23 E-01	2.35 E+00	5.47 E+0
Cs-137	mCi	1.07 E+00	9.47 E+00	2.60 E+00	8.32 E-01	3.19 E+00	8.44 E+00
F-18	mCi	6.59 E+00	4.65 E-01	4.37 E+00	7.18 E-01	5.58 E-01	--
I-131	mCi	2.43 E+00	3.85 E+00	3.33 E+00	1.29 E+00	3.42 E+00	3.89 E+00
I-132	mCi	5.42 E+00	1.53 E+00	5.23 E+00	4.80 E-01	6.4 E-02	--
I-133	mCi	1.36 E+01	1.01 E+01	1.56 E+01	5.94 E+00	6.29 E+00	2.19 E+00
I-134	mCi	8.52 E-01	--	2.0 E+00	--	--	--
I-135	mCi	1.38 E+01	7.05 E+00	9.69 E+00	1.27 E+00	1.82 E+00	--
La-140	mCi	(<8.2 E-09)	(<9.5 E-09)	(<1.0 E-08)	(<1.6 E-08)	(<8.9 E-09)	(<1.5 E-08)
Mn-54	mCi	(<2.7 E-08)	1.82 E-01	(<3.4 E-08)	1.36 E-01	(<3.2 E-08)	2.81 E-01
Na-24	mCi	1.45 E+00	9.9 E-01	2.59 E+00	--	--	--
Nb-95	mCi	(<2.2 E-08)	(<3.9 E-08)	(<2.8 E-08)	5.26 E-02	(<2.5 E-08)	2.76 E-01
Ru-103	mCi	(<2.4 E-08)	(<4.0 E-08)	(<2.2 E-08)	(<3.7 E-08)	(<2.7 E-08)	2.69 E-01
Sb-124	mCi	5.94 E-01	1.10 E+00	5.50 E-01	6.07 E-02	2.11 E-02	1.81 E+00
Sb-125	mCi	8.87 E-01	1.86 E+00	1.06 E+00	1.83 E-01	1.58 E-01	1.19 E+00
Sr-89	mCi	8.87 E-01	1.0 E-02	2.4 E-02	4.96 E-01	4.23 E-01	3.08 E-01
Sr-90	mCi	1.16 E+00	5.6 E-03	(<2.9 E-09)	5.06 E-02	3.53 E-02	8.1 E-03
Te-132	mCi	(<1.9 E-08)	(<3.1 E-08)	(<1.8 E-08)	(<2.8 E-08)	(<2.2 E-08)	1.46 E-01

1979 Table I Report of Radioactive Effluents: Liquid - Total

Isotope	Unit	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Zr-95	mCi	(<4.1 E-08)	(<6.5 E-08)	(<4.3 E-08)	(<7.0 E-08)	(<4.4 E-08)	2.78 E-01
Total	mCi	5.60 E+01	5.37 E+01	5.41 E+01	2.09 E+01	2.30 E+01	4.64 E+01

1979	Table I Report of Radioactive Effluents: Liquid - Waste Disposal System					Page 4
Isotope	Unit	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Ag-110m	mCi	1.84 E-02	8.36 E-02	3.77 E-02	6.95 E-01	3.2 E-02	6.12 E-01
Ba-140	mCi	(<8.9 E-08)	(<1.6 E-07)	(<8.8 E-08)	(<1.4 E-07)	(<1.0 E-07)	(<1.2 E-07)
Co-57	mCi	(<1.6 E-08)	(<2.4 E-08)	(<1.5 E-08)	1.36 E-02	(<1.7 E-08)	(<1.9 E-08)
Co-58	mCi	6.33 E-01	1.53 E+00	5.79 E-01	1.94 E+00	4.18 E-01	6.03 E+00
Co-60	mCi	1.93 E+00	5.87 E+00	1.94 E+00	3.09 E+00	1.47 E+00	7.25 E+00
Cr-51	mCi	(<2.0 E-07)	(<3.3 E-07)	(<1.9 E-07)	(<3.0 E-07)	(<2.3 E-07)	3.43 E+00
Cs-134	mCi	6.97 E-01	3.97 E+00	2.53 E-01	1.39 E-01	1.18 E+00	2.77 E+
Cs-137	mCi	1.07 E+00	6.35 E+00	3.54 E-01	3.35 E-01	1.80 E+00	5.01 E+00
I-131	mCi	(<2.3 E-08)	(<3.9 E-08)	(<2.1 E-08)	7.78 E-02	(<2.9 E-08)	6.12 E-01
La-140	mCi	(<8.2 E-09)	(<9.5 E-09)	(<1.0 E-08)	(<1.6 E-08)	(<8.9 E-09)	(<1.5 E-08)
Mn-54	mCi	(<2.7 E-08)	1.82 E-01	(<3.4 E-08)	1.18 E-01	(<3.2 E-08)	2.81 E-01
Nb-95	mCi	(<2.2 E-08)	(<3.9 E-08)	(<2.8 E-08)	5.26 E-02	(<2.5 E-08)	2.76 E-01
Ru-103	mCi	(<2.4 E-08)	(<4.0 E-08)	(<2.2 E-08)	(<3.7 E-08)	(<2.7 E-08)	2.69 E-01
Sb-124	mCi	5.94 E-01	1.10 E+00	5.50 E-01	6.07 E-02	2.11 E-02	1.81 E+00
Sb-125	mCi	8.87 E-01	1.86 E+00	1.06 E+00	1.83 E-01	1.58 E-01	1.19 E+00
Sr-89	mCi	8.87 E-01	1.0 E-02	2.4 E-02	1.5 E-02	1.4 E-02	2.15 E-01
Sr-90	mCi	1.16 E+00	5.6 E-03	(<2.9 E-09)	9.0 E-03	(<2.6 E-09)	(<2.6 E-09)
Te-132	mCi	(<1.9 E-08)	(<3.1 E-08)	(<1.8 E-08)	(<2.8 E-08)	(<2.2 E-08)	1.46 E-01
Zr-95	mCi	(<4.1 E-08)	(<6.5 E-08)	(<4.3 E-08)	(<7.0 E-08)	(<4.4 E-08)	2.78 E-01
Total	mCi	7.88 E+00	2.10 E+01	4.80 E+00	6.73 E+00	5.09 E+00	3.02 E+01

1979 Table I Report of Radioactive Effluents: Liquid - Secondary System

Isotope	Unit	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Co-58	mCi	1.56 E+00	1.69 E+00	--	--	3.31 E-01	--
Co-60	mCi	2.39 E+00	1.55 E+00	2.27 E+00	3.32 E+00	2.45 E+00	4.57 E+00
Cs-134	mCi	--	2.39 E+00	1.93 E+00	1.84 E-01	1.17 E+00	2.70 E+00
Cs-137	mCi	--	3.12 E+00	2.25 E+00	4.97 E-01	1.39 E+00	3.43 E+00
F-18	mCi	6.59 E+00	4.65 E-01	4.37 E+00	7.18 E-01	5.58 E-01	--
I-131	mCi	2.43 E+00	3.85 E+00	3.33 E+00	1.21 E+00	3.42 E+00	3.28 E+00
I-132	mCi	5.42 E+00	1.53 E+00	5.23 E+00	4.80 E-01	6.4 E-02	--
I-133	mCi	1.36 E+01	1.01 E+01	1.56 E+01	5.94 E+00	6.29 E+00	2.19 E+00
I-134	mCi	8.52 E-01	--	2.0 E+00	--	--	--
I-135	mCi	1.38 E+01	7.05 E+00	9.69 E+00	1.27 E+00	1.82 E+00	--
Mn-54	mCi	--	--	--	1.8 E-02	--	--
Na-24	mCi	1.45 E+00	9.9 E-01	2.59 E+00	--	--	--
Sr-89	mCi	(<2.9 E-09)	(<2.9 E-09)	(<2.9 E-09)	4.81 E-01	4.09 E-01	9.34 E-02
Sr-90	mCi	(<2.9 E-09)	(<2.9 E-09)	(<2.9 E-09)	4.16 E-02	3.53 E-02	8.1 E-03
Total	mCi	4.81 E+01	3.27 E+01	4.93 E+01	1.42 E+01	1.78 E+01	1.63 E+01

Footnote: Concentrations in uCi/ml

Total		JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Kr-85	mCi	(<5.1 E-06)	(<6.1 E-06)	(<8.7 E-06)	1.82 E+01	(<8.7 E-06)	(<8.7 E-06)
Xe-131m	mCi	(<7.2 E-07)	(<9.7 E-07)	(<1.1 E-06)	(<1.3 E-06)	(<9.6 E-07)	(<9.6 E-07)
Xe-133	mCi	1.99 E+00	2.59 E+01	3.18 E-01	5.78 E+00	3.68 E-01	2.96 E+00
Xe-133m	mCi	(<1.6 E-07)	(<1.9 E-07)	(<2.3 E-07)	(<2.9 E-07)	(<2.1 E-07)	(<2.2 E-07)
Xe-135	mCi	6.0 E-01	2.35 E-01	(<2.6 E-08)	(<3.3 E-08)	(<2.4 E-08)	3.77 E-01

Waste Disposal System							
Kr-85	mCi	(<5.1 E-06)	(<6.1 E-06)	(<8.7 E-06)	1.82 E+01	(<8.7 E-06)	(<8.7 E-06)
Xe-131m	mCi	(<7.2 E-07)	(<9.7 E-07)	(<1.1 E-06)	(<1.3 E-06)	(<9.6 E-07)	(<9.6 E-07)
Xe-133	mCi	1.99 E+00	2.59 E+01	3.18 E-01	5.78 E+00	3.68 E-01	2.96 E+00
Xe-133m	mCi	(<1.6 E-07)	(<1.9 E-07)	(<2.3 E-07)	(<2.9 E-07)	(<2.1 E-07)	(<2.2 E-07)
Xe-135	mCi	6.0 E-01	2.35 E-01	(<2.6 E-08)	(<3.3 E-08)	(<2.4 E-08)	3.77 E-01

Secondary System							
Kr-85	mCi	--	--	--	--	--	--
Xe-131m	mCi	--	--	--	--	--	--
Xe-133	mCi	--	--	--	--	--	--
Xe-133m	mCi	--	--	--	--	--	--
Xe-135	mCi	--	--	--	--	--	--

1979 Table II Report of Radioactive Effluents: Airborne

	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
A. Fission and Activation Gases						
1. Total Release (Ci)	3.33 E+02	2.27 E+02	1.40 E+02	2.49 E+02	1.20 E+02	3.52 E+02
2. Avg Rel Rate for Period (μCi/sec)	1.1 E+02	9.5 E+01	4.7 E+01	1.0 E+02	5.0 E+01	1.2 E+02
*3. Max Rel Rate for Period (μCi/sec)	5.9 E+02	2.6 E+03	4.3 E+03	1.3 E+04	9.2 E+03	1.0 E+04
B. Iodine - 131						
1. Total Iodine - 131 (Ci)	7.1 E-04	2.5 E-03	1.2 E-03	9.7 E-04	2.3 E-03	6.8 E-03
2. Avg Rel Rate for Period (μCi/sec)	2.4 E-04	1.0 E-03	4.0 E-04	4.0 E-04	9.6 E-04	2.3 E-03
C. Particulates						
1. Particulates with t1/2>8d (Ci)	1.21 E-04	3.66 E-03	3.42 E-03	1.34 E-03	2.55 E-04	1.42 E-03
2. Avg Rel Rate for Period (μCi/sec)	4.0 E-05	1.5 E-03	1.1 E-03	5.6 E-04	1.1 E-04	4.7 E-04
3. Gross Alpha Radioactivity (Ci)	3.1 E-09	(<2.4 E-12)	1.1 E-09	3.8 E-09	(<2.4 E-12)	3.4 E-08
D. Tritium						
1. Total Release (Ci)	9.17 E-02	9.9 E-02	1.03 E-01	1.27 E-01	1.19 E-01	1.44 E-01
2. Avg Rel Rate for Period (μCi/sec)	3.1 E-02	4.1 E-02	3.4 E-02	5.3 E-02	5.0 E-02	4.8 E-02

*Maximum airborne release rate averaged over one hour for each month. Technical Specification limit is 6.7 E+04 μCi/sec averaged over one hour.

E. Percent of Applicable Limit	Quarter III	Quarter IV
1. Fission and Activation Gases (%)	7.3 E-01	7.6 E-01
2. I-131 and Part (t1/2>8d) (%)	2.5 E-01	3.9 E-01

NOTE: Numbers in parentheses represent maximum sensitivity in μCi/cc.

1979 Table II Airborne Releases - Particulate Page 2

Isotope	Unit	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Ba-140	Ci	(<7.6 E-14)	(<1.2 E-13)	(<6.9 E-14)	1.4 E-04	(<8.0 E-14)	1.9 E-04
Co-58	Ci	3.7 E-05	4.3 E-05	9.2 E-06	1.5 E-05	1.5 E-05	1.2 E-04
Co-60	Ci	6.7 E-05	3.6 E-03	3.4 E-03	8.2 E-04	2.0 E-04	6.3 E-04
Cr-51	Ci	(<1.5 E-13)	(<2.4 E-13)	(<1.6 E-13)	(<4.1 E-13)	(<1.9 E-13)	3.6 E-05
Cs-134	Ci	4.7 E-06	2.9 E-06	1.8 E-06	9.0 E-05	1.3 E-05	6.8 E-05
Cs-136	Ci	(<1.8 E-14)	(<4.6 E-14)	(<2.0 E-14)	(<7.1 E-14)	3.2 E-06	(<8.7 E-14)
Cs-137	Ci	1.2 E-05	9.4 E-06	8.0 E-06	1.3 E-04	1.9 E-05	1.2 E-04
I-131	Ci	(<2.3 E-14)	1.7 E-06	(<1.7 E-14)	3.8 E-06	4.7 E-06	1.4 E-05
La-140	Ci	(<1.7 E-14)	(<2.5 E-14)	(<1.4 E-14)	1.3 E-04	(<3.1 E-14)	1.9 E-04
Mn-54	Ci	(<2.6 E-14)	(<5.8 E-14)	1.8 E-06	2.8 E-06	(<3.6 E-14)	2.4 E-05
Nb-95	Ci	(<2.1 E-14)	(<4.1 E-14)	(<1.9 E-14)	(<3.3 E-14)	(<2.4 E-14)	3.7 E-06
Ru-103	Ci	(<1.5 E-14)	(<2.9 E-14)	(<1.6 E-14)	(<4.1 E-14)	(<1.9 E-14)	8.2 E-07
Sr-89	Ci	5.5 E-07	7.0 E-07	3.4 E-07	(<3.8 E-16)	3.6 E-07	2.6 E-05
Sr-90	Ci	(<2.0 E-16)	(<2.5 E-16)	(<2.0 E-16)	4.6 E-06	8.2 E-09	8.2 E-09
Total	Ci	1.21 E-04	3.66 E-03	3.42 E-03	1.34 E-03	2.55 E-04	1.42 E-03

Fission and Activation Gases							
Isotope	Unit	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Ar-41	Ci	7.39 E+00	4.61 E+00	3.48 E+00	2.03 E+00	7.66 E-01	1.45 E+00
Kr-85	Ci	7.78 E-02	8.7 E-02	(<3.2 E-05)	(<3.1 E-05)	1.82 E-02	3.23 E-01
Kr-85m	Ci	5.9. E-02	6.58 E-02	5.0 E-02	3.16 E-02	3.1 E-03	9.2 E-03
Kr-87	Ci	1.63 E-02	(<7.1 E-06)	5.58 E-02	1.4 E-02	(<9.5 E-07)	(<2.1 E-06)
Kr-88	Ci	5.05 E-02	9.16 E-02	7.06 E-02	1.0 E-02	(<1.1 E-06)	(<3.8 E-06)
Xe-131m	Ci	1.51 E-02	3.45 E-02	(<4.3 E-06)	(<4.5 E-06)	1.52 E-02	1.76 E+00
Xe-133	Ci	3.23 E+02	2.20 E+02	1.34 E+02	2.44 E+02	1.18 E+02	3.46 E+02
Xe-133m	Ci	3.31 E-02	2.21 E-01	2.64 E-01	7.62 E-01	4.9 E-01	8.79 E-01
Xe-135	Ci	1.68 E+00	1.60 E+00	8.89 E-01	1.37 E+00	6.05 E-01	1.06 E+00
Xe-135m	Ci	2.23 E-01	3.37 E-01	7.18 E-01	3.33 E-01	2.34 E-01	(<1.4 E-06)
Xe-138	Ci	2.38 E-02	4.2 E-02	4.70 E-01	1.71 E-01	(<1.4 E-06)	(<4.7 E-06)
Total	Ci	3.33 E+02	2.27 E+02	1.40 E+02	2.49 E+02	1.20 E+02	3.52 E+02

Halogens (Gaseous)							
Isotope	Unit	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
I-131	Ci	7.1 E-04	2.5 E-03	1.2 E-03	9.7 E-04	2.3 E-03	6.8 E-03
I-133	Ci	1.8 E-03	1.4 E-03	1.6 E-03	1.4 E-03	1.3 E-03	1.1 E-03
I-135	Ci	7.0 E-04	3.7 E-04	5.1 E-04	7.0 E-05	1.0 E-04	(<1.5 E-13)
Br-82	Ci	--	9.0 E-05	5.3 E-04	(<5.6 E-14)	1.7 E-04	3.9 E-04
Total	Ci	3.21 E-03	4.36 E-03	3.84 E-03	2.44 E-03	3.87 E-03	8.29 E-03

ATTACHMENT II

RADIOACTIVE WASTE REPORT

July 1, 1979 to December 31, 1979

Date of shipment	Curies	Cu. Ft.	Disposition
7- 2-79	0.510	140	Buried in Barnwell, SC
7-14-79	0.164	1,237	"
7-16-79	1.295	140	"
7-31-79	0.633	1,174	"
8- 3-79	0.400	140	"
8-15-79	0.102	195	"
8-24-79	0.219	195	"
8-28-79	0.454	662	"
8-28-79	0.271	140	"
9- 6-79	0.325	70	"
9-18-79	0.673	140	"
9-26-79	0.569	556	"
10- 4-79	0.364	165	"
10-11-79	0.009	195	"
10-16-79	0.486	1,065	"
10-18-79	1.425	140	"
10-24-79	0.266	768	"
10-25-79	0.070	517	"
11-29-79	0.297	1,330	"
12-14-79	1.440	150	"
12-22-79	0.096	123	"
21 shipments	10.068 Ci	9,242 Cu. Ft.	

On site as of January 1, 1979

8.891 Ci 2,069 Cu. Ft.

ATTACHMENT III

TURKEY POINT: Units 3 & 4

Environmental Radiological Monitoring

(7-01-79 to 12-31-79)

1. Introduction

This report is submitted in accordance with Turkey Point Plant Technical Specifications.

Environmental samples were collected and analysed in conformance with the requirements of the Technical Specifications. The minimum frequency of collection and analyses for specific radionuclides and sample types as required by these specifications has been met or exceeded except where samples were biologically unavailable.

Strontium analyses for this reporting period have been delayed due to the relocation of the State's Radiological Laboratory; these results will be shown in a separate report when analyses in progress are completed.

2. The Monitoring Program

Period Covered: This current report covers the period from July 1, 1979 to December 31, 1979.

Analytical Responsibility: Environmental radiological monitoring at Turkey Point Plant is carried out by the Dept. of Health and Rehabilitation Services of Florida (DHRS). All samples are collected and analysed by DHRS personnel.

Number of Samples Analyzed: A total of 778 analyses were performed on 606 samples collected from 35 different sampling locations during the period of this report. TABLE 1 summarizes the mean and range values of these analyses.

Split-Sample Analyses: Twelve samples were collected to be analyzed by the DHRS/ERDA Split-sampling program.

3. Evaluation of Data

a) Table I compares, where applicable, the analyses of media sampled at various locations with similar analyses of control location samples; shows the mean and range of similar analyses at all sampling locations; lists the location with the highest values noted for the type of analysis made.

b) The higher Cs^{137} value noted at sample location, T-56, on July 11, 1979 is attributed to the unusually large amount of organic material in the sample.

c) The ^{3}H concentration at sampling location T-84 is consistent with ^{3}H levels previously observed in the cooling canal system. The other canal location, T-97, had a slightly lower concentration of ^{3}H.

d) No significant increases above previously reported data have been observed in Gross Beta-DS and ^{3}H concentrations at location T-75 in the Fresh Water Canals.

e) The ^{3}H concentrations in the Ground Water Wells at sampling locations T-91 and T-92 continue to be of the same magnitude as previously reported.

f) The concentration levels of ^{58}Co and ^{60}Co in the bottom sediments of the cooling canal at sample location T-84 continue to be of the same order of magnitude as previously reported.

g) All data have been compared with pre-operational data and have been found to be within previously observed limits.

h) Where applicable, comparisons of test sample location data with that of the control sample show no differences in concentration levels except as noted in TABLE 1.

4. Conclusions

The concentration level of any radionuclide reported in TABLE 1 will contribute much less than the maximum permissible limits of individual or population group exposure that could result if there had been a continuous intake of radionuclides having concentration values equal to those permitted by APPENDIX B, TABLE II, 10-CFR-20. Therefore, the operations of Turkey Point Plant Units 3 & 4 are not contributing harmful effects or irreversible damage to either the environment or to the health and safety of individuals or population groups in the regions surrounding Turkey Point Plant.